

Plastic waste in bird nests can act like a tiny time capsule

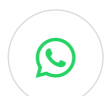
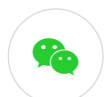
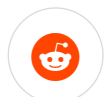
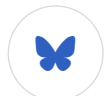
Expiration dates help biologists trace the building of some avian homes back in history—in one case to 1991

4 MAR 2025 • 5:00 PM ET • BY [GENNARO TOMMA](#)



Urban ecologist Auke-Florian Hiemstra sorts through trash found inside a coot's nest. HIELCO KUIPERS

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If you want to figure out how long fridge cheese has been hanging around, check its expiration date. The same, it turns out, goes for birds' nests. For the first time, researchers have used expiration dates—printed on plastic waste incorporated into coot nests—to [figure out when these structures were built](#). The findings, reported in *Ecology*, could help scientists better understand the histories of individual nesting sites and the history of the species breeding there.

“I was surprised by the sheer amount of trash in the main nest they described,” says Daniel Baldassarre, an ornithologist at the State University of New York Oswego who wasn't involved in the study. In one case, he notes, the team was able to date a nest all the way back to 1991. “I never would have guessed that a coot nest location would last that long.”

Auke-Florian Hiemstra hit on the approach while studying the nests of common—or Eurasian—coots (*Fulica atra*) in Amsterdam's city center. The birds—which weigh nearly 1 kilogram, with black plumage and white beaks—incorporate plastic debris between the twigs of their nests. Hiemstra, an urban ecologist at the Naturalis Biodiversity Center, wondered whether the trash could reveal when the nests were built.



He and his colleagues collected coot nests at the end of the breeding season, when the nests were abandoned. Then they sorted through the nesting material and pulled out all the plastic. Some of the trash contained legible printing, including expiration dates with clearly defined years. Packaging from items with short shelf lives, such as avocado and milk, were especially helpful to point to a precise moment in time, Hiemstra notes.

Most of the nests were not particularly old; the expiration dates on the trash used to build them rarely went back more than 3 years. But one, christened the “Rokin nest” after the canal it was found in, contained 635 bits of plastic, some with expiration dates going back more than 30 years.

The layers of Rokin nest, built on top of an old foundation pile underneath a docking station, unraveled like a time capsule of human waste: The outermost structure contained approximately 15 face masks from the COVID-19 pandemic, and its base held candy bar packaging promoting the 1994 FIFA World Cup.

“We found pieces of nest material which were just as old as I was, which was a very strange moment,” Hiemstra says.

The researchers believe at least three generations of common coots—which can live about 5 to 10 years—used the Rokin nest over its 30-year span.

In the wild, common coots build a new nest every year, made of quickly decaying plant materials. But in urban environments, long-lasting plastic may give coots an advantage, the team says, extending the lives of their nests and affording them more time to spend finding food or defending their territory.

However, too much plastic in a nest can entangle the birds, sometimes killing them. Reusing old nests can also be dangerous, as the old trash can harbor harmful parasites, such as red mites.

“I’m not sure about the idea that incorporating artificial material would be beneficial to the birds,” Baldassarre says. “It seems equally, if not more likely, that the artificial materials are simply overabundant and readily available in the environment.”

As a tool for dating bird nests, Hiemstra believes he and his colleagues have just scratched the surface. There could be even older plastic-filled nests out there, he notes, and this strategy could help urban ecologists date nesting sites.

This could be helpful for researchers trying to understand how a species is faring in a certain habitat, Baldassarre says. If nests are being used for long time, it might mean the birds are struggling to find new nesting sites, which could impact their ability to breed. Hiemstra adds, “There may be way more data in a bird nest than you may realize.”



